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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,524	12/02/2004	Masaaki Ukita	SUT-0258	4502

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RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

EXAMINER
MIDKIFF, ANASTASIA

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/516,524	UKITA, MASAAKI	
	Examiner	Art Unit	
	Anastasia Midkiff	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 December 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02 December 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 35a.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

Further, throughout the specification, beginning on Line 23 of Page 31, the references to the claims are improper and should be deleted or replaced with the

subject matter of the originally filed claims in their entirety. Applicant is requested to delete or replace all references to the claims in the entire specification.

The disclosure is also objected to because of the following informalities: On Line 10 of Page 17, please replace "applyingmeans" with --applying means--.

Appropriate correction is required.

Claim Objections

Claims 3, 8, 9, 11, 13, and 14 are objected to because of the following informalities:

With respect to Claim 3, Line 2 recites the limitation "the vibration controller" wherein there is insufficient antecedent basis for this limitation in the claim. Also, in Line 3 of Claims 3 and 11, the Claims refer to a tube voltage and current, wherein there is insufficient antecedent basis for "tube" in the claims.

With respect to Claim 8, Line 2 recites the limitation "said holder" wherein there is insufficient antecedent basis for this limitation in the claim. Perhaps Applicant intended Claim 8 to depend from Claim 7 rather than from Claim 1.

Claims 9 and 14 are objected to based on their dependency upon Claim 8.

With respect to Claim 11, in Line 2, the phrase "up to twice depth of electrons penetration" is grammatically incorrect. The Examiner suggests replacing "up to twice depth of electrons penetration" with --up to twice the depth of electron penetration--.

With respect to Claim 13, in Line 2, the phrase "an bore" is grammatically incorrect. The Examiner suggests replacing "an bore" with --a bore--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 10, 13, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to Claim 4, in Lines 2-3 the phrase "to control the vibration amplitude more than the electron beam diameter and variable," is not understood, and, therefore, indefinite.

With respect to Claim 10, the claim is indefinite insofar as the structure imparted by a rubber element or flexure so that a target is vacuum-sealed is not understood.

With respect to Claim 13, the claim is indefinite, as Line 2 recites, "an bore," wherein it is unclear what said bore is within, *i.e.,* what structure has been bored.

With respect to Claim 15, the claim is indefinite, as the limiting meaning of "a diameter of collision" in Line 2 is not understood.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 8-10, 12, 13, 15, and 16, as they are best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent to DuMond (USP# 2,133,606).

With respect to Claim 1, DuMond teaches an apparatus for generating x-rays by irradiating a target (11) with an electron beam (26, Figures 2 and 2a), comprising vibration applying means (12) for vibrating said target in directions parallel to a surface thereof (Figure 2, and Page 2 Column 2 Lines 63-75 through Column 2 Lines 1-8 and 56-59).

With respect to Claim 2, DuMond further teaches said vibration applying means (12) is arranged to vibrate said target (11) so that said electron beam (26) has a colliding spot (at 26) describing a circular track on said target (Page 2 Column 2 Lines 70-75, Page 3 Column 1 Lines 1-7, and Figure 2a).

With respect to Claims 3 and 4, DuMond further teaches the apparatus comprises a vibration controller (42) for controlling said vibration applying means (Page 3, Column 1, Lines 64-71) based an electron beam diameter (Page 3, Column 2, Lines 46-49), said controller arranged to control the vibration amplitude more than the electron beam diameter and variable (Page 3, Column 1 Lines 71-75 and Column 2 Lines 1-7).

With respect to Claim 5, DuMond further teaches said vibration controller (42) is arranged to make the vibration frequency variable (Page 3, Column 2, Lines 46-75).

With respect to Claims 8 and 9, DuMond further teaches apparatus further comprises a target holder (13) with flexures (31) for attaching and supporting said holder (Page 2, Column 2, Lines 24-40). With respect to said flexures known to be made by electrical discharge machining, this is a process by which a product is made, wherein the process does not impose any structural limitation on the product, and, as such, the process is not given any patentable weight (See MPEP 2113).

With respect to Claim 10, DuMond further teaches said target (11) is vacuum-sealed by rubber elements or fixtures (Page 2, Column 2, Lines 26-46).

With respect to Claim 12, DuMond further teaches said vibration applying means (12) is arranged to displace said target (11, Figures 2 and 2a).

With respect to Claim 13, DuMond further teaches said vibration applying means (12) is disposed in a bore (2) in which said target (11) is located (Figure 1).

With respect to Claim 15, DuMond further teaches said target (11) has a thickness corresponding to a diameter of collision of said electron beam (26, Figures 2 and 2a).

With respect to Claim 16, DuMond further teaches said target (11) is disposed at an angle to said electron beam (Figure 2).

Claims 1-5, 8, 9, 12, 13, 15, and 16, as they are best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent to Catlin (USP# 1,997,676).

With respect to Claim 1, Catlin teaches an apparatus for generating x-rays by irradiating a target (20, 52, 54, 55) with an electron beam (Figures 1-10), comprising vibration applying means (22) for vibrating said target in directions parallel to a surface thereof (Figures 1-10 and Page 2 Column 2 Lines 1-18).

With respect to Claim 2, Catlin further teaches said vibration applying means (22) is arranged to vibrate said target (20, 52, 54, 55) so that said electron beam has a colliding spot describing a linear, circular, or two-dimensionally shaped track on said target (Page 3, Column 1, Lines 17-27).

With respect to Claims 3 and 4, Catlin further teaches the apparatus comprises a vibration controller for controlling said vibration applying means (Page 2, Column 2, Lines 10-66) based on a tube current and voltage (Page 2, Column 2, Lines 33-40), said controller arranged to control the vibration amplitude more than the electron beam diameter and variable (Page 2, Column 2, Lines 52-62).

With respect to Claim 5, Catlin further teaches said vibration controller is arranged to make the vibration frequency variable (Page 2 Column 2 Lines 13-18 and 52-62).

With respect to Claims 8 and 9, Catlin further teaches apparatus further comprises a target holder (23) with flexures (26) for attaching and supporting said holder (Page 1 Column 1 Lines 20-30). With respect to said flexures known to be made by electrical discharge machining, this is a process by which a product is made, wherein the process does not impose any structural limitation on the product, and, as such, the process is not given any patentable weight (See MPEP 2113).

With respect to Claim 12, Catlin further teaches said vibration applying means (22) is arranged to displace said target (20, 52, 54, 55, Figures 1-10).

With respect to Claim 13, Catlin further teaches said vibration applying means (22) is disposed in a bore (24) in which said target (20, 52, 54, 55) is located (Figures 1-10).

With respect to Claim 15, Catlin further teaches said target (20, 52, 54, 55) has a thickness corresponding to a diameter of collision of said electron beam (Figures 1-10).

With respect to Claim 16, Catlin further teaches said target (52, 54) is disposed at an angle to said electron beam (Figures 6 and 7).

Claims 1, 2, 8-10, 12, 13, and 14, as they are best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent to Carter (USP# 3,737,698).

With respect to Claim 1, Carter teaches an apparatus for generating x-rays by irradiating a target (48, 50) with an electron beam (Figure 1), comprising vibration applying means (20, 12) for vibrating said target in directions parallel to a surface thereof (Column 2, Lines 39-51).

With respect to Claim 2, Carter further teaches said vibration applying means (20, 12) is arranged to vibrate said target (48, 50) so that said electron beam has a colliding spot describing a linear shaped track on said target (Column 2 Lines 39-51, and Column 3 Lines 13-16).

With respect to Claims 8 and 9, Carter further teaches apparatus further comprises a target holder (12) with flexures (40, 42) for attaching and supporting said holder (Figure

1). With respect to said flexures known to be made by electrical discharge machining, this is a process by which a product is made, wherein the process does not impose any structural limitation on the product, and, as such, the process is not given any patentable weight (See MPEP 2113).

With respect to Claim 10, Carter further teaches said target (48, 50) is vacuum-sealed by rubber elements or fixtures (42, Column 2 Lines 34-37).

With respect to Claim 12, Carter further teaches said vibration applying means (20, 12) is arranged to displace said target (48, 50, and Column 2 Lines 39-51).

With respect to Claim 13, Carter further teaches said vibration applying means (20, 12) is disposed in a bore (14) in which said target (48, 50) is located (Figure 1).

With respect to Claim 14, Carter further teaches said flexures (40, 42) are shaped thin in a direction of vibration of said target, and thick in a direction perpendicular to the direction of vibration (Figure 1).

Claims 1-4, 11, 12, and 16, as they are best understood, are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent to Price et al. (USP# 6,560,315).

With respect to Claim 1, Price et al. teach an apparatus for generating x-rays by irradiating a target (122) with an electron beam (148), comprising vibration applying means (Column 4 Lines 53-57, and Column 5 Lines 60-64) for vibrating said target in directions (138) parallel to a surface thereof (Column 4, Lines 18-23 and Figure 3).

With respect to Claim 2, Price et al. further teach said vibration applying means is arranged to vibrate said target (122) so that said electron beam has a colliding spot

describing a linear, circular, or two-dimensionally shaped track on said target (Column 4, Lines 18-23 and 53-57).

With respect to Claims 3 and 4, Price et al. further teach the apparatus implicitly comprises a vibration controller for controlling said vibration applying means (Column4 Lines 18-23 and 53-57, and Column 5 Lines 52-57) based on a temperature measured adjacent a spot of electron beam collision (Column 5, Lines 52-57), said controller arranged to control the vibration amplitude more than the electron beam diameter and variable (Column 5, Lines 52-57).

With respect to Claim 11, Price et al. further teach said target (122) has a thickness up to twice the depth of electron penetration (Column 2, Lines 49-50) calculated from a tube voltage and said target material (Column 5, Lines 52-57).

With respect to Claim 12, Price et al. further teach said vibration applying means is arranged to displace said target (Figures 3-5).

With respect to Claim 16, Price et al. further teach said target (122) is disposed at an angle to said electron beam (Figures 4-5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6 and 7, as they are best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over DuMond, as for Claim 1 above, and in view of U.S. Patent to Hirokawa et al. (USP# 5,134,640).

With respect to Claims 6 and 7, DuMond teaches most of the elements of the claimed invention, including vibration applying means integrated with target holder (28, 29) to define a closed space (Figure 1), but does not teach said vibration applying means includes a piezoelectric device.

Hirokawa et al. teach a piezoelectric device (18, 19) as an alternate, equivalent means for a motor to apply vibration (Column 4 Lines 19-35, and Figure 2) to an x-ray target window (14) or x-ray mirror (13) in an x-ray tube (21, 22).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the piezoelectric device of Hirokawa et al. as the vibration applying means of DuMond, such devices known to be substituted for motor vibration means with a reduction in parts, as taught by Hirokawa et al.

Claims 6 and 7, as they are best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Catlin, as for Claim 1 above, and in view of U.S. Patent to Hirokawa et al. (USP# 5,134,640).

With respect to Claims 6 and 7, Catlin teach most of the elements of the claimed invention, including vibration applying means integrated with target holder to define a closed space (Figures 1-10), but does not teach said vibration applying means includes a piezoelectric device.

Hirokawa et al. teach a piezoelectric device (18, 19) as an alternate, equivalent means for a motor to apply vibration (Column 4 Lines 19-35, and Figure 2) to an x-ray target window (14) or x-ray mirror (13) in an x-ray tube (21, 22).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the piezoelectric device of Hirokawa et al. as the vibration applying means of Catlin, such devices known to be substituted for circuitry-driven motor vibration means with a reduction in parts, as taught by Hirokawa et al.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patents to: Zunick (USP# 2,926,270), Brown et al. (USP# 3,398,307), Grady (USP# 4,399,551), Campbell (USP# 6,154,521), and U.S. Patent Application Publication to Bertsche (PGPUB# 2002/0101958) regarding anode/target translation/vibration and associated means for applying same.

U.S. Patent to Kok (USP# 3,386,805) regarding target vibration and measuring temperature of target for controlling vibration.

U.S. Patents to Geluk (USP# 5,631,945), and Petach et al. (USP# 6,792,076) regarding piezoelectric devices used to apply vibrations to devices within x-ray tubes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anastasia Midkiff whose telephone number is 571-272-5053. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASM
5/9/06

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER